

1 **SECTION 6-02, CONCRETE STRUCTURES**

2 **April 7, 2003**

3 **6-02.3(2)A Contractor Mix Design**

4 The last sentence of the first paragraph is revised to read:

5

6 All other concrete mix designs except those for lean concrete and commercial concrete
7 shall have a minimum cementitious material content of 564 pounds per cubic yard of
8 concrete.

9

10 **6-02.3(2)B Commercial Concrete**

11 This section is revised to read as follows:

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13 Commercial concrete shall have a minimum compressive strength at 28 days of 3000
14 psi in accordance with AASHTO T 22. Commercial concrete placed above the finished
15 ground line shall be air entrained and have an air content from 4.5 percent to 7.5
16 percent per AASHTO T 152. Commercial concrete does not require plant approval, mix
17 design, or source approvals for cement, aggregate, and other admixtures.

18

19 Where concrete Class 3000 is specified for nonstructural items such as, culvert
20 headwalls, plugging culverts, concrete pipe collars, pipe anchors, monument cases,
21 luminaire bases, pedestals, cabinet bases, guardrail anchors, sign post foundations,
22 fence post footings, sidewalks, curbs, and gutters, the Contractor may use commercial
23 concrete. If commercial concrete is used for sidewalks, curbs, and gutters, it shall have
24 a minimum cementitious material content of 564 pounds per cubic yard of concrete and
25 shall be air entrained. Commercial concrete shall not be used for structural items such
26 as, bridges, retaining walls, box culverts, or foundations for high mast luminaires, mast
27 arm traffic signals, cantilever signs, and sign bridges. The Engineer may approve other
28 nonstructural items not listed for use as commercial concrete.

29

30 **6-02.3(4)A Qualification of Concrete Suppliers**

31 In the seventh paragraph the reference to "70 revolutions" is revised to "30 revolutions".

32

33 **6-02.3(4)C Consistency**

34 The first paragraph is supplemented with the following:

35

36 4. 9 inches for shafts when using Class 4000P, provided the water cement ratio does
37 not exceed 0.44 and a water reducer is used meeting the requirements of 9-23.6.

38

39 5. 5.5 inches for all concrete placed in curbs, gutters, and sidewalks.

40

41 The second paragraph is revised to read:

42

43 When a high range water reducer is used, the maximum slump listed in 1, 2, 3, and 5
44 above, may be increased an additional 2 inches.

45

46 **6-02.3(5)A General**

47 In the fourth paragraph, in 2., revise "proceeding" to "preceding".

48

49 **6-02.3(6)A Weather and Temperature Limits to Protect Concrete**

50 The section "Cold Weather Protection" is revised to read:

1
2 The Contractor shall provide a written procedure for cold weather concreting to the
3 Engineer for review and approval. The procedure shall detail how the Contractor will
4 prevent the concrete temperature from falling below 50° F. Permission given by the
5 Engineer to place concrete during cold weather will in no way ensure acceptance of the
6 work by the Contracting Agency. Should the concrete placed under such conditions
7 prove unsatisfactory in any way, the Engineer shall still have the right to reject the work
8 although the plan and the work were carried out with his permission.
9

10 The Contractor shall provide and maintain a recording thermometer on the concrete
11 surface at a location specified by the Engineer. During freezing or near-freezing
12 weather, data from this thermometer shall be readily available to the Engineer.
13

14 The Contractor shall not mix nor place concrete while the air temperature is below
15 35° F, unless the water or aggregates (or both) are heated to at least 70° F. The
16 aggregate shall not exceed 150° F. If the water is heated to more than 150° F, it shall be
17 mixed with the aggregates before the cement is added. Any equipment and methods
18 shall heat the materials evenly.
19

20 The Contractor may warm stockpiled aggregates with dry heat or steam, but not by
21 applying flame directly or under sheet metal. If the aggregates are in bins, steam or
22 water coils or other heating methods may be used if aggregate quality is not affected.
23 Live steam heating is not permitted on or through aggregates in bins. If using dry heat,
24 the Contractor shall increase mixing time enough to permit the super-dry aggregates to
25 absorb moisture.
26

27 Any concrete placed in air temperatures below 35° F shall be immediately enclosed. Air
28 temperature within the enclosure shall be maintained such that the concrete surface
29 temperature stays between 50° F and 90° F, and the relative humidity shall be above
30 80 percent. These conditions shall be maintained for a minimum of seven days or for
31 the cure period required by Section 6-02.3(11), whichever is longer. If artificial heat is
32 used to maintain the temperature inside the enclosure, moisture shall be added to the
33 enclosure to maintain the humidity as stated above. The Contractor shall stop adding
34 moisture 24 hours before removing the heat. Extra protection shall be provided for
35 areas especially vulnerable to freezing (such as exposed top surfaces, corners and
36 edges, thin sections, and concrete placed into steel forms).
37

38 If weather forecasts predict air temperatures below 35° F during the seven days just
39 after the concrete placement, the Contractor may place the concrete only if his
40 approved cold weather concreting plan is implemented.
41

42 In addition, if air temperatures fall below 35°F within 7 days after placement of concrete,
43 the Contractor shall implement his approved cold weather concreting plan.
44

45 **6-02.3(14)B Class 2 Surface Finish**

46 The first sentence of the first paragraph is revised to read:
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48 The Contractor shall apply a Class 2 finish to all above-ground surfaces not receiving a
49 Class 1 finish as specified above unless otherwise indicated in the Contract.
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6-02.3(17)D Falsework Support Systems: Piling, Temporary Concrete Footings, Timber Mudsills, Manufactured Shoring Towers, Caps, and Posts
Under **Temporary Concrete Footings and Timber Mudsills**, Number 1, **Granular Soil**, the first sentence is revised to read:

The Contractor shall conduct on-site tests according to AASHTO T 235.

6-02.3(17)J Face Lumber, Studs, Wales, and Metal Forms

On page 6-60, the paragraph beginning with "All corners shall be beveled... etc." is revised to read:

All corners shall be beveled 3/4 inch. However, footings, footing pedestals, and seals need not be beveled unless required in the Plans.

6-02.3(24)C Placing and Fastening

In the second paragraph, the following is inserted after the third sentence:

All epoxy-coated bars in the top mat of the roadway slab shall be tied at all intersections. Other epoxy-coated bars shall also be tied at all intersections, but shall be tied at alternate intersections when spacing is less than 1 foot in each direction.

6-02.3(24)H Epoxy-Coated Steel Reinforcing Bar

In the fifth paragraph, the second and third sentences are deleted and replaced by the following:

All bars shall be placed and fastened as specified in Section 6-02.3(24)C.

6-02.3(25)E Contractors Control Strength

In the tenth paragraph, the first sentence is deleted and replaced by the following:

The Contractor shall coat cored holes with an epoxy bonding agent and patch the holes using the same type concrete as that in the girder, or a mix approved during the annual plant review and approval. The epoxy bonding agent shall meet the requirements of Section 9-26.1 for Type II, Grade 2 epoxy.

6-02.3(26)E Ducts

The first paragraph under "**Ducts for External Exposed Installation**" is revised to read:

Duct shall be high-density polyethylene (HDPE) conforming to ASTM D 3350. The cell classification for each property listed in Table 1 shall be as follows:

Property	Cell Classification
1	3 or 4
2	2, 3, or 4
3	4 or 5
4	4 or 5
5	2 or 3
6	2, 3, or 4

The color code shall be C.

1 **6-02.3(26)H Grouting**

2 The sixth paragraph is revised to read:

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4 The Contractor shall proportion the mix to produce a grout with a flow of 11 to 20
5 seconds as determined by ASTM C 939, Flow of Grout for Preplaced Aggregate
6 Concrete (Flow Cone Method). The grout ejected from the end vent shall have a
7 minimum flow of 11 seconds.
8

9 **6-02.3(28) Precast Concrete Panels**

10 This section is revised to read:

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12 The Contractor shall perform quality control inspection. The manufacturing plant for
13 precast concrete units shall be certified by the Precast/Prestressed Concrete Institute's
14 Plant Certification Program for the type of precast member to be produced, or the
15 National Precast Concrete Association's Plant Certification Program or be an
16 International Congress Building Officials Evaluation Services recognized fabricator of
17 structural precast concrete products, and shall be approved by WSDOT as a Certified
18 Precast Concrete Fabricator prior to the start of production. WSDOT Certification will be
19 granted at, and renewed during, the annual precast plant review and approval process.
20 Products that shall conform to this requirement include noise barrier panels, wall panels,
21 floor and roof panels, marine pier deck panels, retaining walls, pier caps, and bridge
22 deck panels. Precast concrete units that are prestressed shall meet all the
23 requirements of Section 6-02.3(25).
24

25 The Contracting Agency intends to perform Quality Assurance Inspection. By its
26 inspection, the Contracting Agency intends only to facilitate the work and verify the
27 quality of that work. This inspection shall not relieve the Contractor of any responsibility
28 for identifying and replacing defective material and workmanship.
29

30 Prior to the start of production of the precast concrete units, the Contractor shall advise
31 the Engineer of the production schedule. The Contractor shall give the Inspector safe
32 and free access to the work. If the Inspector observes any nonspecification work or
33 unacceptable quality control practices, the Inspector will advise the plant manager. If the
34 corrective action is not acceptable to the Engineer, the unit(s) will be rejected.
35

36 **6-02.3(28)B Casting**

37 The following new paragraph is inserted after the first paragraph:

38
39 Concrete shall meet the requirements of Section 6-02.3(25)B for annual pre-approval of
40 the concrete mix design, and slump.
41

42 **6-02.3(28)H Shipping**

43 This section is revised to read:

44
45 Precast units shall not be shipped until the concrete has reached the specified design
46 strength, and the Engineer has reviewed the fabrication documentation for contract
47 compliance and stamped the precast concrete units " Approved for Shipment.". The
48 units shall be supported in such a manner that they will not be damaged by anticipated
49 impact on their dead load. Sufficient padding material shall be provided between tie
50 chains and cables to prevent chipping or spalling of the concrete.